

Philosophy of Engineering and Technology 5

Ilse Oosterlaken

Jeroen van den Hoven *Editors*

The Capability Approach, Technology and Design



Springer

Contents

Part I Introduction

- 1 **The Capability Approach, Technology and Design:
Taking Stock and Looking Ahead** 3
Ilse Oosterlaken
- 2 **Human Capabilities and Technology** 27
Jeroen van den Hoven

Part II Technology

- 3 **Liberation from/Liberation within: Examining One
Laptop per Child with Amartya Sen and Bruno Latour** 39
Kim Kullman and Nick Lee
- 4 **Evaluating Emerging ICTs: A Critical
Capability Approach of Technology** 57
Yingqin Zheng and Bernd Carsten Stahl
- 5 **“How I Learned to Love the Robot”: Capabilities,
Information Technologies, and Elderly Care** 77
Mark Coeckelbergh
- 6 **Towards a Sustainable Synergy: End-Use Energy
Planning, *Development as Freedom*, Inclusive
Institutions and Democratic Technics** 87
Manu V. Mathai
- 7 **Marrying the Capability Approach, Appropriate Technology
and STS: The Case of Podcasting Devices in Zimbabwe** 113
Ilse Oosterlaken, David J. Grimshaw, and Pim Janssen

8 From Individuality to Collectivity: The Challenges for Technology-Oriented Development Projects	135
Álvaro Fernández-Baldor, Andrés Hueso, and Alejandra Boni	
9 Technology Choice in Aid-Assisted Parliamentary Strengthening Projects in Developing Countries: A Capability Approach.....	153
Malik Aleem Ahmed	
 Part III Design	
10 Design, Risk and Capabilities	173
Colleen Murphy and Paolo Gardoni	
11 Re-conceptualizing Design Through the Capability Approach.....	189
Crighton Nichols and Andy Dong	
12 Processes for Just Products: The Capability Space of Participatory Design.....	203
Alexandre Apsan Frediani and Camillo Boano	
13 Inappropriate Artefact, Unjust Design? Human Diversity as a Key Concern in the Capability Approach and Inclusive Design	223
Ilse Oosterlaken	
 Author Biographies.....	 245
Author Index.....	249
Subject Index.....	255

Chapter 5

“How I Learned to Love the Robot”: Capabilities, Information Technologies, and Elderly Care

Mark Coeckelbergh

5.1 Introduction

Information technologies seem promising when it comes to improving care for elderly people. Intelligent systems could be used for the purpose of monitoring, care, and therapy. For example, robotic devices could assist elderly people to move around, autonomous pet robots could act as their artificial companions and allow therapeutic interaction, and telemonitoring systems (perhaps involving chip implants or intelligent nanobots) could allow medical professionals to keep track of people's health condition. In general, it seems that information technologies would allow people to live longer independently and better in their own homes.

In societies that face an ageing population, shortage of care workers, and political pressure to limit the allocation of public resources to health care, this may seem an attractive path. However, there are also potential ethical problems with this technological solution. For instance, some worry that privacy will be violated if data are sent to all kinds of other parties, that isolated living in a digitally enhanced environment would be deprive people of human contact and love, or that only the rich will enjoy the benefits of these technologies. For example, Sparrow and Sparrow have argued that the introduction of robots in the aged-care sector would be detrimental to elderly people's well-being since it would most likely result in a decrease in the amount of human contact (Sparrow and Sparrow 2006).

In this chapter I will not directly discuss these ethical issues, but sketch a general framework for the evaluation of information technologies in elderly care and illustrate its potential. I will first show that the capability approach is a useful and

M. Coeckelbergh (✉)

Department of Philosophy, University of Twente, P.O. Box 217, 7500 AE Enschede,
The Netherlands

e-mail: m.coeckelbergh@utwente.nl

attractive way to make explicit what is at stake, ethically speaking, in elderly care. I will focus on Nussbaum's version of the capability approach and offer my interpretation of her list of capabilities as a list of criteria to evaluate the quality of lives – including the lives of the elderly. Then I will propose a modification to the capability approach that moves beyond a purely instrumentalist view of technology: drawing on earlier work I will argue that technology is not a mere means to realize capabilities, but that the criteria or goals themselves – the capabilities – change as a result of technology. Finally, I will further suggest methodological recommendations based on these insights and illustrate what this approach may mean in relation to elderly care by exploring a scenario of robotic elderly care in which information technologies transform people's capabilities for social affiliation and engagement in relations with humans and non-humans. In my conclusion I will indicate how this proposed interpretation of the capability approach is compatible with Nussbaum's ideas on the 'multiple realizability' of capabilities and the importance of moral imagination and moral sensitivity.

5.2 A Capability Approach to Ethics of Care Technology

One way to articulate both the promises and the ethical worries concerning the use of information technology in elderly care is to use the capabilities approach as a descriptive and evaluative framework. The capabilities approach was initially developed by Sen and Nussbaum in response to standard approaches to human development in development economics. They argued that well-being should not be evaluated by looking at the Gross National Product (GNP) of a nation, or, more generally, at the material resources people have; instead, they argue, we should focus on what people are actually able to do (Nussbaum and Sen 1993; Nussbaum 2000), on expanding 'the real freedoms that people enjoy' (Sen 1999, p. 3), and, more fundamentally, on their human dignity (Nussbaum 2006). Human development – in 'development' countries and elsewhere – is not (only) about giving people formal freedoms, material goods, and technology; it is about empowering people to live better lives.

I propose that we apply this approach to ethics of elderly care.¹ It is not enough to give elderly people care technology; what matters is what these people can do with it in relation to their well-being, that is, what matters is that it *enhances* their well-being and agency. From this perspective, the promise and goal of using information technology in elderly care can be framed as empowering people to live independently, to enjoy a higher quality of life, and to live their lives in dignity. This puts the emphasis on what people can do with the technology (the goal) rather

¹ I limit the topic of this chapter to ethics of elderly care but the capability approach can be more widely applied across various domains of ethics and ethics of technology.

than on the technology itself and its particular technical details. There is no point in giving people the most advanced technological equipment if they cannot use it to improve the quality of their lives. More, it is ethically unacceptable if it diminishes their human dignity.

In order to evaluate whether or not a particular technology actually contributes to that quality of life and indeed to elderly people's human dignity (the ultimate end Nussbaum puts forward), we may use Nussbaum's list of capabilities as criteria to evaluate the quality and dignity in elderly care.² The list includes the following 'central capabilities':

1. Life: 'Being able to live to the end of a human life of normal length; not dying prematurely, or before one's life is so reduced as to be not worth living.'
2. Bodily health, including nourishment and shelter
3. Bodily integrity: free movement, freedom from sexual assault and violence, having opportunities for sexual satisfaction
4. Being able to use your senses, imagination, and thought; experiencing and producing culture, freedom of expression and freedom of religion
5. Emotions: being able to have attachments to things and people
6. Practical reason: being able to form a conception of the good and engage in critical reflection about the planning of one's life
7. Affiliation: being able to live with and toward others, imagine the other, and respect the other
8. Other species: being able to live with concern to animals, plants and nature
9. Play: being able to laugh, to play, to enjoy recreational activities
10. Control over one's environment: political choice and participation, being able to hold property, being able to work as a human being in mutual recognition

(Nussbaum 2006, pp. 76–78; my summary)

This list of capabilities can be used as a conceptual tool to make explicit what is at stake, ethically speaking, in elderly care and to develop criteria to evaluate the quality of that care.

First, while such general criteria may not allow us to solve particular difficult cases or to determine the outcome of practical ethical deliberations, they can guide our reflection as ethical signposts in the following way. If what matters is that elderly people can live the last years of their lives in dignity, then the list makes explicit that such dignity means and what good elderly care should aim for. This helps us to speculate about what technology might do to people and to ask the right questions. For instance, using the capabilities as criteria for evaluation we may ask: Does the technology really enhance the capability of affiliation with others or does it only allow us to 'stay connected' while diminishing real human contact? And if intelligent systems were to take over some decisions, would they sufficiently respect people's own capability of practical reason? Would bodily integrity be respected if intelligent nanobots were to 'live' in the body? Moreover, since the capabilities approach has

²This argument can also be applied to health care in general (Coeckelbergh 2010a, b).

always been concerned with issues of justice, one could ask if these technologies will only benefit elderly people in technologically advanced countries and if that is problematic from a social justice perspective. There may be gaps within one country – between people who can afford the high-tech care and people who can't – and between 'advanced' and 'developing' nations.

Second, this focus on capabilities does not only allow us to specify how the technology might change people's lives and to ask ethical questions; if further developed it also enables us to *evaluate* these changes, to answer the questions. Starting from Nussbaum's list, one can set more concrete thresholds that specify which level of which capability must be reached. For instance, one could specify a minimum level of physical health, below of which the life of the elderly person is judged to be 'not worth living' (the first capability of Nussbaum's list), and aim for bringing every elderly person over the threshold.³ The list leaves open what this threshold should be. This is to be regarded as an advantage. The capability approach, with its stress on dignity and its list-approach, is 'universalist' enough, yet at the same time it also leaves plenty of room for interpretation in particular contexts. According to Nussbaum, the list can be 'specified in accordance with local beliefs and circumstances' and the threshold level needs to be determined by political consensus (Nussbaum 2000, p. 77).

Moreover, as a capability approach, this approach to ethics of elderly care has the further advantage that it moves beyond the abstract discourse of liberal rights in so far as these rights give people only formal freedoms and protections. For example, we agree that all elderly people should have the right to life and liberty, as the Universal Declaration of Human Rights prescribes. But this says little about what elderly people can actually do given their specific condition (physical condition, dependence on others, etc.). Using the capability approach, we can analyze and evaluate elderly people's capabilities given their specific conditions and in particular contexts and circumstances. With a view of evaluating information technology, then, we can analyze how the specific technology changes or might change elderly people's capabilities and using thresholds (agreed upon) we can evaluate these changes. For example, *if* in a particular home care context artificially intelligent information technology were to diminish elderly people's capability for social affiliation to a degree that is judged to be ethically unacceptable, then the use of this technology in elderly care would be unacceptable.

But what is social affiliation in this context, and can it be defined independently from the technology? Can *any* capability in elderly care be defined independently from technology? What do we mean by 'technology'?

³ Note that judging a particular life to be 'not worth living' does not necessarily imply that it is therefore justified to end such a life (e.g. suicide or euthanasia). On the contrary, it seems that a capability approach would rather require us to help the person to reach the minimum level. And if this were impossible, then there may be other ethical considerations for blocking the suicide or euthanasia option.

5.3 Towards a Non-instrumentalist View of Care Technology

Proponents of the capability approach, if concerned with technology at all, tend to view technology as a mere means to its ends – ends formulated in terms of capabilities and their ultimate aim (e.g. human dignity or freedom). Applied to elderly care as proposed in the previous pages, a capability approach that were to keep this assumption would see technology as an instrument to realize the aims of elderly care, here expressed in terms of capabilities. Hence little attention is paid to the technologies themselves and what they do to the very meaning of the capabilities we wish to use as evaluative criteria.

One specific reason why capability theorists inexplicitly assume this instrumental role of technology (the more general reason is too little attention to technologies and their unintended effects, a lacuna shared with most other theories in practical philosophy), lies at the heart of the 'classic' version of the capability approach as explained above, which says that it is not enough to give people material *means* if with this means the goals of development – e.g. human dignity (the *end*) – are not reached. Thus, the very motivation for people in development studies to adopt a capability approach can be framed as a move from means to ends: focus on which end people can reach rather than on the means (money, material goods, technology).

However useful this shift has been for moving forward development studies, it is worth considering the limitations of thinking along the lines of this means-ends scheme. These limitations are at least partly due to a misguided understanding of the relation between technology and human ends (e.g. ethical values). Contemporary philosophy of technology teaches that technologies are *not* mere means but 'do' more than we intend to do with them. They are not mere instruments or tools, but change our goals and what we consider to be important. Consider for example how modern means of transportation have changed the way we organize work and leisure time, how the anti-conception pill has changed how we shape and evaluate personal relations, and how mass communication media influence our life projects. The goals of elderly care – whether or not we articulate them by using the capability approach – are not immune for such techno-moral change. For example, today people around 65 have different lives, but also different expectations and aspirations due to the exponential development of medical technology during the past century.

If this is true, we can no longer take for granted that what we now or in the past meant by health, affiliation, etc. will remain the same in the future. This renders it difficult to evaluate the promises of information technology for elderly care in the future. One answer to this difficulty is to recommend using our moral imagination. I will say more about this below. However, based on current transformations, we can already discuss – and indeed *question* – some (current) ethical worries with regard to information technology in elderly care. For instance, if we are concerned about privacy, we need to take into account that information-technological practices today do not promote privacy and that many young people care less about privacy than people did in the past. Bodily integrity has already been 'violated' by many pharmaceutical products. And for many of us the capability of affiliation has been transformed by information technology – in particular mobile technologies.

Indeed, the elderly we are concerned about in the scenario above are not grandma or grandpa, but you and I. Our capabilities have already been transformed by information technology and will continue to be transformed until we reach the point that we need (more) elderly care. The meanings of health, affiliation, play, etc., therefore, are not independent from information technologies but are partly constituted by these technologies. They change as technology changes.

Acknowledging this weakening of the means-ends dichotomy does not imply that all our ethical worries are necessarily misguided, but it means that we have to be far more precise when we voice them. For instance, if we care about friendship and love and claim that information technology threatens the possibility for realizing and enjoying friendship and love, then we have to show why the use of particular information technologies like software for social networking and on-line communication, which are likely to be used by the elderly of the future (and are used already today), would be harmful for the kind of relations we value most. But in addition we also have to consider that what we mean by friendship and love might be and become influenced by the very technologies under discussion.

5.4 Imagining and Interpreting Capabilities: A Scenario of Robotic Elderly Care

Such an exercise cannot be done without engaging with current and emerging technologies, and with users and designers of the technologies. 'Emerging' is important here: we do not only want to know what current technologies do to our capabilities: we also want to know what *future* technologies could do to them.

Whether or not we can obtain knowledge about the future is a perennial philosophical issue and I shall not provide a comprehensive discussion of it here. For the purpose of this brief inquiry, let me make explicit my own preferred approach, which can be summarized as the use of 'moral imagination', or, more precisely 'techno-moral imagination'. Although we can never obtain certainty about the future, we can explore future possibilities by using our imagination: by imagining technological change and its potential consequences for the moral life. This use of the imagination is not arbitrary, but is based on available information and is preferably active and creative. One way to proceed in this case is to study technological promises (research proposals, interviews in the media, and so on) and to write – not just read and discuss – fictional scenarios in order to imaginatively explore how future technologies could re-shape not only elderly care, but also our capabilities and their meaning.

Although fictional scenarios have been used before in exploring how emerging technologies bring about moral change (Swierstra et al. 2009),⁴ the capability

⁴My use of a fictional scenario is inspired by my research on moral imagination (Coeckelbergh 2007) and by collaboration with Tsjalling Swierstra on moral change and techno-moral scenarios, in particular my experience of writing scenarios about nanotechnology for his 'Vignetten en scenario's' Nanopodium project (2009–2010).

approach offers a precise and helpful way to frame the ethical, normative issues at stake. Consider the following scenario, which explores how information technologies might re-shape elderly people's capabilities for social affiliation and engagement in relations with humans and non-humans.

January 26, 2060. Grandpa wakes up in his CareCap.⁵ Robodog Simply jumps on his bed and greets him – he's clearly happy to see that his companion is awake and appears to feel better. The friendly robot helps with washing, plays a little bit with him, and then fetches breakfast for him. Yesterday was a bad day: Simply had to do a medical intervention when the NanoCare system detected problems in the belly. But now grandpa is ready again for a chat and a game. This will not only keep his brain functions going; he will also have fun and improve his skills. Via the net he talks with his friends and plays a game with his grandchildren.

Grandpa remembers that in the old days, when he was still working (there used to be a sharp division between working life and pension), he regarded the idea of 'isolated' e-care as a nightmare idea: he thought it would be utterly inhumane to lock up people in a high-tech environment with robots and other electronic stuff that provides 'care'. But when he considers his condition now, he has little to worry about. It turned out that his elderly life in CareCap was not so different from his working life towards the end of his career: at the time he was also always connected to the net, his health was monitored by RFIDs, and he spent more time talking to his children on the mobile phone and via FaceNet than seeing them in 'real' life. What was real? It was true that he had now less physical contact with other people, and was more 'isolated' in this sense, but it was also 'real' that via the net he was connected to the whole world, including people in the same situation and condition. And a robotic dog was much more intelligent and pleasant than a real one (in addition to the fact that it was much easier to maintain). What was freedom? With his bodily condition, he could not live long outside his capsule, true. He needed the electronic support systems and could only make short robot-assisted excursions into the green area (not the red!). It is true that he had not the freedom to travel with his body. But his mind was free to dwell in all 'real' and fictional places via the net. Via FaceNet and TwitImage many people knew about his activities. He had plenty of followers. In a sense he felt even more active than when he was a child. His mental life was surely more interesting than that of his parents when they were at the height of their capacities. His body too was much healthier now, due to the different care systems. And he had great fun with the robot dog. For sure, he thought, I'm more happy than they were in their old age, in their homes for elderly care, where they had 'human contact' but where their minds and bodies were slowly withering away.

With this fictional scenario, I do not wish to promote this particular kind of technologies, elderly care and indeed this conception of good elderly care and the good life. But it serves as an illustration of what I have in mind when I claim that the relation between technology and capabilities is not merely instrumental. The scenario suggests that in the future we might interpret capabilities differently, due to changes to technologies and to our lives. Of course we may disagree with this particular interpretation. We might want to further discuss it. But in any case the meaning of capabilities is not fixed but requires a hermeneutic process, a work of interpretation, which can leave out technology only at the expense of distorting our understanding of the practice of care – and indeed any practice. When we think of social affiliation,

⁵ Care Capsule: semi-closed system for habitation, monitoring, and care of elderly people over 100.

for instance, we usually construct the meaning of this capability without referring to technology, for example by referring to experiences of two physical people – humans – interacting in a physical space. We might think of companionship, friendship, or love between two humans in a natural environment. But today as in the past, such imagery of social affiliation does no justice to the nature and plurality of human experience. Social affiliation takes and has always taken different forms and has often involved technology in various ways. Consider architecture, music, letter writing, and other ‘humanistic’ and ‘cultural’ yet highly technologically mediated faces of social affiliation. Affiliation between humans is often directly and otherwise indirectly co-shaped by technologies. Moreover, to restrict social affiliation to affiliation between humans does no justice to the extent, significance, and variety of relations between humans and non-humans, such as pets or – perhaps for some of us – robots. It may be that these non-humans are ‘mere animals’ or ‘mere machines’, but as a matter of fact in many contexts we do not treat them as such and act as if they belong to our social world. Hence, the capability of social affiliation should not be interpreted as excluding such relations a priori, but should be related to other capabilities Nussbaum mentions: relations to other species, play, etc. In this sense, there is not so much a ‘list’ of capabilities but a normative-hermeneutic ‘web’ of capabilities.

Applied to the question regarding elderly care, capabilities, and information technology, this approach suggests that an evaluation of information technology in this context should not be restricted to an evaluation of the technology *in the light of* capabilities, since that formula assumes a purely instrumental relation between the ‘object’ of evaluation and the evaluative ‘criteria’. Instead, the evaluation should involve a discussion of the capability and its relation to technology. The fictional scenario explores just one way in which not only the practice of elderly care but also the very meaning of the capability of affiliation might change due to information technology. It suggests that future technology – but also the way technology shapes our lives today – is not only likely to change our lives, but also how we evaluate those lives: it is likely to alter what we consider a good life, dignity, freedom, and good social affiliation. It transforms the criteria of evaluation as much as it transforms us.

Thus, whether or not we wish to endorse the particular vision of technology and of the techno-care future suggested in this fictional scenario, the exercise reminds us that we should remain critical of the instruments we use to judge whether or not this vision counts as a beautiful dream or as a nightmare. Here it means that if and when we use the capability approach to evaluate the use of information technology in health care, we should carefully work out not only what we mean by ‘social affiliation’, ‘bodily health’, ‘control over one’s environment’ etc., but also how the meaning of these terms might change in the future as a result of the very technologies we are trying to evaluate.

Note that this does not ‘weaken’ the capability approach as a critical tool. I concede that by connecting the concepts ‘capability’ and ‘technology’ in this way, this interpretation of the capability approach reduces the distance between principle and practice, between evaluative criteria and objection of evaluation. It seems to reduce

the normative power and authority of the criteria themselves. In this sense the approach may become less 'solid' as a normative framework: it seems to be built on criteria that are unstable (capabilities). However, at the same time the ethical-hermeneutical interpretation of the capability approach proposed here opens up a second space from which normative power may be derived: by using our moral imagination, we can create a space between the present and the future (or the past), which allows us to achieve critical distance from our current ethical points of view. In other words, it adds another, less principled and more historical-imaginative pathway that may help us to achieve what Socrates considered to be the aim of ethics.

5.5 Conclusion

The capabilities approach offers a powerful conceptual tool for gaining more insight in the ethical issues concerning the use of information technology in elderly care, in particular if it is interpreted and modified in the way proposed above and if it is combined with well-informed moral-imaginative work. Using the capability of 'social affiliation' as an example, I have explored a fictional scenario in order to illustrate how this application and modification of the capability approach requires us to reflect on what information technology might do to elderly care *and* to the criteria we employ to evaluate those possible changes. This ethical-hermeneutical interpretation and use of the capability approach may make it a less 'solid' (if that should be a goal in normative ethics at all), but more adequate conceptual instrument to capture and explore what information technologies might do to our lives – now and in the future.

For those of us who feel attracted to Nussbaum's version of the capability approach, this interpretation is good news for at least two reasons. First, the proposed hermeneutical approach is compatible with what Nussbaum (perhaps somewhat misleadingly⁶) calls the 'multiple realizability' of capabilities: every society needs to discuss what a particular capability means for a particular society. Items on the list 'can be more concretely specified in accordance with local beliefs and circumstances', which leaves room for political deliberation (Nussbaum 2000, p. 77). What my proposal implies and emphasizes, is that this dialogical and interpretative process has to be re-done in the light of new technologies. In other words, interpretations of capabilities differ not only in place (different cultures), as Nussbaum has argued, but also in time, for example when new media and technologies change our ideas and our practices. Second, Nussbaum has always recommended the exercise of moral imagination and fiction as a means to explore different lives and possibilities

⁶The term 'realizability' suggests that the capabilities and their meaning are fixed, whereas there might be different interpretations about how to realize them in practice. This may be right, but in the light of the ideas presented in this chapter, I prefer to interpret Nussbaum on this point as meaning that the capabilities themselves are also up to interpretation (and indeed negotiation).

in order to become more morally sensitive and practically wise. Indeed, the exercises of techno-moral imagination recommended here are not 'mere science-fiction' if that means they are both unreflective and irrelevant to important and pressing ethical concerns. If there is anything that can save elderly care from a dark and cold future, it is critical reflection that is not only motivated *but also deeply shaped* by our empathy and sympathy with future generations, with less well-off people, with our children and our parents, and indeed with our near-future elderly selves. After all, the question concerning technology and elderly care is *our* question.

References

- Coeckelbergh, M. (2007). *Imagination and principles*. Basingstoke/New York: Palgrave Macmillan.
- Coeckelbergh, M. (2010a). Human development or human enhancement? A methodological reflection on capabilities and the evaluation of information technologies. *Ethics and Information Technology*, 13(2), 81–92.
- Coeckelbergh, M. (2010b). Health care, capabilities, and AI assistive technologies. *Ethical Theory and Moral Practice*, 13(2), 181–190.
- Nussbaum, M. C. (2000). *Women and human development: The capabilities approach*. Cambridge: Cambridge University Press.
- Nussbaum, M. C. (2006). *Frontiers of justice: Disability, nationality, species membership*. Cambridge/London: The Belknap Press of Harvard University Press.
- Nussbaum, M. C., & Sen, A. (1993). *The quality of life*. Oxford: Clarendon.
- Sen, A. (1999). *Development as freedom*. Oxford/New York: Oxford University Press.
- Sparrow, R., & Sparrow, L. (2006). In the hands of machines? The future of aged care. *Minds and Machines*, 16(2), 141–161.
- Swierstra, T., Stemerding, D., & Boenink, M. (2009). Exploring techno-moral change: The case of the obesity pill. In P. Sollie & M. Düwell (Eds.), *Evaluating new technologies* (pp. 119–138). Dordrecht: Springer.